**Screencast:** 08-disk-partitions-filesystem.webm or 08-disk-partitions-filesystem.mp4

**REFERENCE**
**LaUSAH Chapter 8, Storage**
**TLCL Chapter 15, Storage Media**

### Hard Drives

- Types
  - IDE / ATA / PATA (two connectors, 40 or 80 pin)
  - SATA
  - SSD
  - SCSI
  - SAS
  - Fiber Channel
  - USB, Firewire, eSATA
- Single disk
- Multiple disks
- Disk image file
- RAID 0, 1, 5, 10
  - hardware - BIOS - disk based
  - software - mdadm - disk or partition based
- NAS - NFS, SMB (service oriented filesharing)
- SAN - iSCSI, ATA over Ethernet (AoE)
- LVM - lvm, system-config-lvm

### Partitioning Applications

- fdisk - fdisk -l (lists all drives seen) (gdisk or parted/gparted for GPT)
- sfdisk
  - sfdisk -d /dev/hda > hda.out
  - sfdisk /dev/hda < hda.out
- gdisk
- parted / gparted
- mount, umount
- Commercial products
  - Partition Magic
  - Partition Commander

### Partitioning Schemes

PC hardware (with an MBR partition table) can have upto 4 primary partitions. If you need more than 4 partitions you'll have to make at least one "extended" partition. Extended partitions are containers for "logical" partitions. Largest partition size is 2TB.

- /
- /boot
- /var
- /home
- swap

A newer type of partition table is on the horizon named GPT. GPT eliminates a number of the restrictions of the MBR partition table. By default, GPT offers 128 partitions (more if desired) as

well as partitions > 2TB. For more information see: http://en.wikipedia.org/wiki/GUID_Partition_Table

### Filesystems

- Types
  - ext2, ext3, ext4
  - swap
  - xfs
  - reiser3
  - ntfs
  - vfat
  - iso9660
  - ufs
  - zfs (Solaris), openzfs (BSDs, Linux, macOS), btrfs (Linux)
- Formating commands
  - mkfs.*, mkfs.ext3, mkfs.ext4, etc
  - mkswap
  - mkfs.ntfs, mkfs.vfat
- Network filesystems
  - NFS
  - SMB
  - GFS
  - Gluster, etc
  - iSCSI (layer 3) and AoE (layer 2)
- /etc/fstab (stores mount definitions)
- Removable media - CD, DVD, USB - Mostly automatic in a GUI, but manually in a TUI. Watch /var/log/messages for device information, use fdisk -l to list, and mount to manually mount
- UUID, LABEL, and device names
- autofs - Automatically mount network shares
- Secure erasure? DBAN or hdparm
- fuse (Filesystem in Userspace)
  - http://en.wikipedia.org/wiki/Filesystem_in_Userspace
- Troubleshooting
  - SMART - smartd
  - fsck, fsck.{fstype}, some filesystem-specific tools